

THE CLAIMS

What is claimed is:

- 5 1. A method for forming an assembly for transfer of a useful layer comprising:
forming a useful layer on a first support having an interface therebetween, and
a residual material on a portion of the first support to form the assembly; and
processing the assembly to attenuate bonding between the useful layer and the
first support caused by the residual material.
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2. The method of claim 1 wherein the useful layer is weakly bonded to the
support to facilitate detachment.
3. The method of claim 1 wherein the interface is a detachable interface layer
15 provided on the first support before forming the useful layer.
4. The method of claim 1 which further comprises:
affixing a free face of the useful layer to a second support; and
detaching the useful layer at the interface to transfer the useful layer to the
20 second support.
5. The method of claim 4 which further comprises detaching the useful layer by
using at least one of tension forces, bending forces and shear stress forces.
- 25 6. The method of claim 4 which further comprises directing at least one of a thin
blade or a jet of fluid to the interface layer to detach the useful layer.
7. The method of claim 1 wherein processing the assembly comprises removing
residual material.
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8. The method of claim 7 which further comprises removing at least a portion of
the first support that is in contact with the removed residual material.
9. The method of claim 7 wherein removing residual material comprises
35 removing at least a portion of a peripheral zone of residual material covering an edge
of the interface.

10. The method of claim 9 wherein the peripheral zone is removed by at least one of splitting or etching.
11. The method of claim 10 wherein the peripheral zone is removed by etching
5 and which further comprises masking the useful layer prior to etching.
12. The method of claim 1 wherein processing of the assembly comprises forming at least one cut or separating channel between a free surface of the useful layer and the interface to separate the useful layer from the residual material.
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13. The method of claim 12 wherein the separating channel is cut by using at least one of a saw splitting technique, a laser splitting technique, and an ion beam splitting and masked chemical etching technique.
14. The method of claim 12 wherein processing of the assembly comprises forming a plurality of cuts or separating channels between a free surface of the useful layer and the interface to separate the useful layer from the residual material and to form a plurality of useful layer islets.
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15. The method of claim 14 which further comprises:
20 affixing free faces of the islets to a second support; and
detaching a majority of the islets at the interface.
16. The method of claim 15 which further comprises detaching the islets by using
25 at least one of tension forces, bending forces and shear stress forces.
17. The method of claim 15 wherein the islets are rectangular.
18. The method of claim 1 wherein processing of the assembly comprises forming
30 a peripheral recess on the first support so that the residual material does not contact the useful layer.
19. The method of claim 18 wherein the width and depth of the peripheral recess is sufficient to accommodate the volume of residual material resulting from formation
35 of the useful layer.

20. The method of claim 1 which further comprises using full wafer epitaxy to deposit at least a portion of the useful layer.
21. The method of claim 20 wherein the useful layer comprises a seed layer for epitaxial growth and at least one epitaxial layer.
22. The method of claim 21 wherein the seed layer is made of at least one of silicon carbide, sapphire, gallium nitride, silicon and aluminum nitride.
23. The method of claim 21 wherein the epitaxial layer is formed from one or more metal nitrides.
24. The method of claim 1 wherein the first support is made from at least one of a semiconductor, a semiconducting or semiconductive carbide, and an insulator material.
25. The method of claim 1 which further comprises providing the interface by at least one of implanting gas species, forming a porous layer that can be attacked chemically, and bonding a detachable layer to the first support before forming the useful layer by using a controlled molecular bonding process.
26. In a support for fabricating substrates or components which can be treated to receive at least a portion of a useful layer, in which the treatment results in the formation of a peripheral zone of residual material, the improvement comprising providing a peripheral recessed zone in the support for receiving the residual material to prevent bonding between the residual material and the useful layer.
27. A support for fabricating substrates or components on substrates which can receive at least a portion of a useful layer, having an interface between the support and a useful layer, wherein the useful layer forms a peripheral zone of material that at least partially covers the interface and the support comprises a peripheral recess zone for receiving the peripheral zone of material to prevent bonding between the residual material and the useful layer.
28. A substrate comprising a support and a useful layer having an interface therebetween, wherein the useful layer is intended to be transferred to a second support by affixing a free surface of the useful layer to the second support and

- detaching it at the interface, wherein the useful layer forms a peripheral zone of material that can at least partially cover the interface and the substrate comprises at least one separating cut or channel located between a free surface of the useful layer and the interface to separate the useful layer from contact with the peripheral zone of material.
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